



(REVIEW ARTICLE)



A review on plant bio piracy and its consequences

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Abstract

The inappropriate use of plant resources can negatively impact the environment in which they are inserted, as well as the humanity that benefits from such resources. Thus, the problem of the present work aims to critically and reflectively approach the concepts and definitions of bio piracy, present examples of this illegal practice, and point out the problems that may arise, both for biodiversity and for society, due to through a review with a bibliographic search of scientific articles.

Keywords: Genetic biodiversity; Plant resources; Illegal; Protection; Preservation

1. Introduction

The misuse or inappropriate use of plant resources causes serious problems to the environment in which they are inserted, as well as the humanity that benefits from such resources. One should think about the well-being of indigenous and traditional communities that live in areas such as the Amazon Forest, ensuring the maintenance of their customs and beliefs, which constitute their genetic heritage [1].

It is also necessary to elaborate a critical construction on the work carried out by administrative bodies, verifying the presence of legality and legitimacy requirements when granting patents whose components integrate biodiversity and this becomes more visible when questioning the concept of modern identity and the recognition of others as subjects of rights and obligations within a society [2].

One of the main environmental issues involving Brazil is the fact that the country has one of the greatest biodiversity on the planet. A wide range of biomes that form the complex and important global diversity [3]. Specific legislation, both in relation to the protection of living beings and borders, is insufficient and ineffective given the number of beings and substances that are trafficked every year. There is no criminalization in Brazil for Bio piracy, only similar ones, such as destruction of the environment, but without ever mentioning the term itself. In addition, many agents that could be indicted for these crimes are companies and laboratories [3].

The environment is the “essence of life”, it is only fair that this right is protected and respected as the fundamental right that it is. Thus, if the environment is not balanced, all the other fundamental rights of human beings are unbalanced and life becomes chaos. In fact, the well-being of future generations depends on the protection of the environment, constituting a paradigm for the quality of life of all species in the world [1].

Faced with this problem, the present work aims to critically and reflectively approach the concepts and definitions of biopiracy, present examples of this illegal practice, and point out the problems that may arise, both for biodiversity and for society.

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2. Material and methods

This review seeks to gather information on the consequences of plant bio piracy. For this, three steps were taken to assess the eligibility of articles obtained by searching using the string "vegetable bio piracy" covered in this review:

- Planning;
- Execution;
- Analysis of results.

All articles obtained were analyzed in terms of content, based on four selection criteria:

- Selection using the title criterion (relationship of words appearing in the title with the review);
 - Selection criteria for the selected abstract (the selected study prioritizes the objective of the review);
 - Selection by full-text assessment for eligibility;
 - Overview of elected articles.
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3. Results and discussion

For a better understanding of the subject, we will start by trying to define "bio piracy", based on the spelling of the word, it could be understood that "bio" refers to life, while "piracy" is something that is not carried out legally. Thus, it would be defined as certain activities carried out inappropriately and involving living beings.

However, it is possible to understand it as the act of appropriating genetic resources, of the most varied forms of traditional knowledge of peoples who live in places where biological diversity is abundant. Thus, biopiracy is characterized by the appropriation of a genetic resource, be it animal or vegetable, or traditional knowledge linked to biological diversity, without the proper authorization of the State from which such resource was extracted or of the community itself. elaborated, perfected and transmitted it from generation to generation [2].

Furthermore, the definition of Bio piracy "came together with the CBD, which proposed conceptualizing it as the exploitation, manipulation, export of biological resources, for commercial purposes, contrary to the norms of the Convention on Biological Diversity" [4].

In this sense, it is notable that both concepts refer to the misuse of resources, dealing with an action that undermines the development of serious research and also the preservation of plant resources, causing damage to biodiversity and the humanity that benefits from it. Thus, Brazil is extremely threatened by this practice, since "the country has one of the greatest biodiversity on the planet, a wide range of biomes that form the complex and important global diversity. Thus, the country stands out as one of the main targets of international bio piracy" [3].

In view of the country's natural wealth, measures are needed to protect the nation's genetic heritage, as this can be lost through biopiracy. For this, protection laws were created with the aim of preventing and punishing those who carry out such practices. However, these Laws are not always applied, hence the importance of inspection to verify whether biodiversity is really being protected and whether those who break the Laws are being punished. An example is Law nº 6.938/1981, which introduced the National Environmental Protection Plan, which was amended by Law nº 7804 of July 18, 1989, which provides for the National Environmental Policy and aims at "the preservation, improvement and recovery of the environmental quality propitiates life, aiming to ensure, in the country, conditions for socio-economic development, the interests of national security and the protection of the dignity of human life" [5]. There is also MP 2186-16 of August 23, 2001, known as the Biological Diversity Law, which deals with the illicit process of biopiracy [6].

However, even in the face of legislation, the occurrence of this illicit practice can be seen, which can be explained by several factors, among them the following stand out: the individual interest in self-benefit, the search for financial resources, the lack of knowledge about the importance and the damage caused, and little rigidity in the application of legislation. In this regard, it is believed that:

Biopiracy is a result of two phenomena, modernization and globalization, considered essential to society. Still, there are other factors that propitiate the illegal commercialization of the natural resources, it is the scarcity of financial investments in the researches in underdeveloped countries or in development and, the high injection of financial resources of developed countries in underdeveloped territories installing NGOs [1].

In this way, it is noted that the practice of bio piracy is a process resulting from the advances of society, which improperly appropriates natural resources and makes irrational use of technology and knowledge of biodiversity, exploiting and extinguishing species that make up the bryophyte classification (plants small), pteridophytes (plants with a system of nutrient-conducting vessels), gymnosperms (plants that have seeds not protected by fruits) and angiosperms (plants with seeds surrounded by a fruit). Thus, some species that for their adaptation, evolved and acquired physiological and morphological characteristics that were passed on to the following generations may be threatened with extinction by biopiracy and disappear from the planet. About this:

Several plant resources with agronomic potential are being illegally exploited and taken to other countries, compromising the income of local producers. This is due to the lack or non-existence of statistical data on extractive products from the Amazon, not accounted for in the official collection, which often become invisible about its role as a survival strategy for thousands of families in the region. Thus, the domestication of the main resources of Amazonian biodiversity, as has already occurred (or is beginning) for cacao, cinchona, rubber, cupuaçuzeiro, jambu, guarana, pupunheira, paricá, mahogany, has been the safest way to acquire income and employment, protection against biopiracy and preservation of remaining stocks [7].

However, the illicit process of biopiracy increasingly seeks innovation, whether in the way it is practiced, in the diversification of bioproducts, in regions with great potential for bioprospecting and little explored, among others. Therefore, the national biodiversity is asking for help, through the signs that are constantly evidenced when they point to the loss of biodiversity due to deforestation, fires, undue exploitation, illegal extractivism, and other anthropic actions. An example of biodiversity threatened by this process of bio piracy is the “Amazon which, being a fertile field, suffers from new techniques of bio piracy, some even supported by flawed legislation, which camouflages the offense with dubious arguments, about what it can really be”. understood as to bioprospecting or bio piracy” [6].

Therefore, this extremely diverse country arouses worldwide interest around it, mainly in relation to its high potential for the production of medicines, raw material for industries and substances that are already scarce or non-existent elsewhere in the world. For this reason, the existence of a series of institutions with norms aimed at preserving diversity is important, without neglecting the importance of their genetic heritage for the cure of countless diseases, in addition to other properties that are relevant for the benefit of society [2].

In the presence of this potential for bio prospecting of some plant species and considering that through new scientific research many other species can also be proven as having potential for the production of bioproducts and bioprocesses, it is important to control the production of medicines, food, hygiene products, cleaning, aesthetics, etc., so that natural resources are used by humanity in a rational way and that biodiversity is preserved, simultaneously benefiting the environment and humanity, maintaining a balanced system between biodiversity and society. Given that:

Brazil has potential in phytotherapeutic production, as it can become a center of medicinal plants in the world, placing itself in the pharmaceutical market of processed substances with high added value and not just serving as a mere supplier of raw materials. Since its great biodiversity means abundant raw material [8].

In this perspective, an example of guaranteeing safe access and rational use of native medicinal, food, ornamental and aromatic plants, promoting the sustainable use of biodiversity, is the case of Mozambique, which in 2004 its government approved the National Medicine Policy Traditional, and in 2008 created the Center for Research and Development in Ethnobotany to:

[...] to protect its natural resources and the traditional knowledge associated with them, and that the millionaire profits to transnational companies that plunder medicinal plant resources in particular and patent the resulting medicines return to their country, since Ethnobotany studies the interaction between man and plants, in their different dimensions ranging from anthropological, ecological, botanical, therapeutic, chemical and toxicological. Being of great importance for the maintenance of the culture, in addition to combining traditional and modern knowledge, allowing a better investigation of the flora still so unknown and its conservation and sustainable management [9].

With this, measures must be adopted against bio piracy, one of which is the registration of patents and traditional knowledge.

4. Conclusion

So that the country's plant genetic heritage is not lost, it is up to researchers and holders of traditional knowledge to commit to recording the discovery of new species, the active principles of bio products, and the bioprocesses involved

in production, legalizing the use of information and keeping them preserved through the creation of protection and conservation areas, as well as the development of germplasm banks to maintain these genetic resources, preserving the biodiversity of the species, through the implementation of research centers to investigate the potential of medicinal plants, creation of herbariums for identification and recording of characteristics of species that are used by traditional communities. In this way, biodiversity will be preserved and the environment and humanity will benefit from the fight against the practice of bio piracy.

Compliance with ethical standards

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